

Thioaptamer Diagnostic System, Phase I

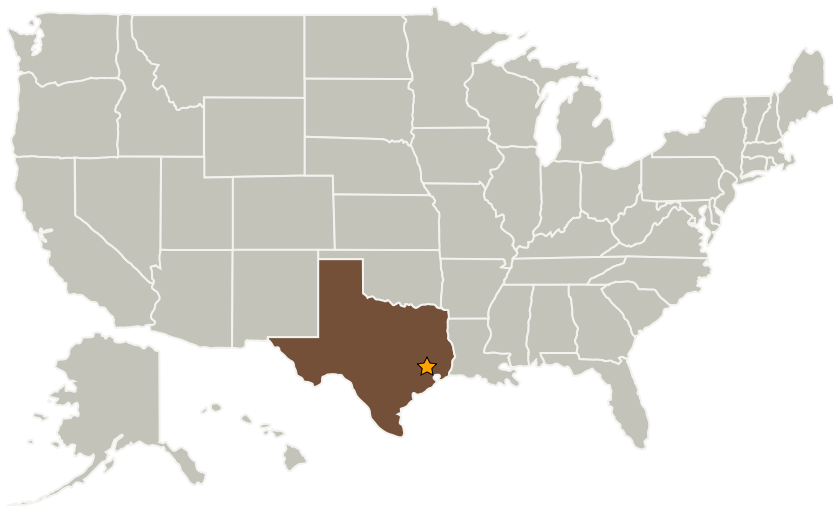
Completed Technology Project (2009 - 2009)



Project Introduction

AM Biotechnologies (AM) will develop a diagnostic system in response to SBIR Topic X10.01 Reusable Diagnostic Lab Technology that will simultaneously detect and quantify numerous protein biomarkers with excellent sensitivity. AM will enhance the current clinical gold standard immunoassay methodology by using its proprietary bead-based aptamer selection process to select dithiophosphate backbone-modified (PS2) "thio" aptamers (PS2-thioaptamers) as replacements for antibodies in immunoassays. The PS2-thioaptamers are binding agents with functionality comparable to antibodies but with very long shelf-life under ambient environment storage. The PS2-thioaptamers bind much more tightly to their targets than regular aptamers without sacrificing specificity, and are much more nuclease resistant. AM's bead-based process allows fast selection and identification of PS2-thioaptamers, which cannot be directly selected using older aptamer technologies such as Systematic Evolution of Ligands by Exponential Enrichment (SELEX). AM will demonstrate PS2-thioaptamer integration into a state-of-the-art microfluidics instrument from Sandia National Laboratory that meets NASA's form factor needs for space flight. The Phase I Project will demonstrate detection and quantification of osteocalcin (OC) using a PS2-thioaptamer in a prototype microfluidics device (TRL-4). Phase II will entail completing the panel of biomarkers for bone demineralization and delivering a prototype of the system to NASA. In Phase III, AM and Sandia will deliver a flight test system to NASA and begin FDA validation of the system for potential use in clinical diagnostics of osteoporosis as well as other conditions.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
AM Biotechnologies, LLC	Supporting Organization	Industry	Houston, Texas

Primary U.S. Work Locations

Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.1 Cryogenic Systems
 - └ TX14.1.2 Launch Vehicle Propellant